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ABSTRACT

Information technology (IT) is a growing field in India, with many present and future job opportunities. The field offers expanding opportunities for women, especially in the services sector. Case studies of nine companies that employ a fair number of women in IT showed that, in general, women had equal opportunities with men, especially in smaller and newer organizations. However, employment policies related to relocation and travel restricted the entrance of women into higher management positions. Interviews with 23 women employed in the IT field showed that all felt that they had careers, not just jobs; that they were better educated than their mothers; and that they expected more education for their children. The women had good support systems at home, usually parents or parents-in-law, but still regarded their home responsibilities as their first priority. However, the women were also dedicated to their careers and derived great satisfaction from them. The study recommended greater access to IT education for women and employment policies and vocational counseling to encourage the re-entry to work of women whose children were of school age. (14 references) (KC)

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TRAINING POLICIES

Discussion Paper No. 30

INFORMATION TECHNOLOGY AND THE TRAINING AND CAREER DEVELOPMENT OF WOMEN: THE CASE OF INDIA

by

Lynette Saldanha

CE052671

Note: Discussion papers are preliminary material circulated to stimulate critical discussion and critical comment.

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PREFACE

This discussion paper is one of a series of five contributions to a research project carried out by the Training Policies Branch on the implications of new information technologies for the career development of women working in the services sector. This research is both timely and important. Not only is the vast majority of women workers in many regions of the world employed in service industries, but it is precisely in this sector and the jobs women perform that new information technologies have been introduced on a large scale.

This area of research is comparatively new, but already, patterns of reorganisation and restructuring of work have already been found to lead to both a reduction of jobs, and the creation of new employment opportunities. It appears however, that these new opportunities will emerge at higher professional and managerial levels and will be more accessible to men than women since they will not require the skills held by clerks and typists, but will be in the fields of systems and data analysis, programming, software design, etc. requiring higher levels of qualifications and specific scientific and technical backgrounds which many women do not have.

The future prospects for women in the services sector therefore, will depend to a great extent on whether they are given the opportunity to move into positions of greater responsibility and higher skill levels. Yet for change to occur, women need to receive appropriate training, guidance and career development opportunities. This issue has guided the work of the researchers who prepared case studies in France, India, Ireland, the Philippines and Sweden. While training is seen as one, if not a major contributing factor improving the employment opportunities of women, it is also clear that it must be combined with other initiative since the introduction of new technology affects all aspects of working life: worker's responsibilities, job content, skill requirements, workload and career prospects.

In this regard, the study has been designed to examine the roles of governments, workers' and employers' organisations. The way in which manpower and skills are deployed is, after all, influenced by government and management policies and priorities; the bargaining power and participation of trade unions in the introduction of new technologies and the restructuring of jobs; and the decisions taken by the management of enterprises.

Women require education and training to adapt to the changing work responsibilities and skill requirements brought about by the introduction of new technology. Only a massive training and

retraining effort can eliminate the mismatch between the skills of female jobseekers and the types of job opportunities that are emerging. And although women need the right skills, they also need the opportunities to apply them, which entails an equal opportunity framework to facilitate their entry into jobs.

Merely declaring training and employment opportunities open to both women and men on an equal basis is not the solution for women precisely because it ignores the barriers which inhibit them from gaining equal benefits. Additional measures must be taken in specific areas and with specific target groups to bring about the desired change. As these studies suggest, it is not the technology itself which is the source of the problems confronting women workers, but economic, social and political factors which combine to confine them to low-paid, low-skilled jobs.

As a final note, we feel it is also important when considering strategies for change to take an international perspective, since the work of women in industrialised and developing countries is inextricably bound. In this regard, a final objective of this research is to bring to the operational activities of the Training Department in the fields of management development and vocational training, a better understanding of the factors which need to be considered in planning and implementing training programmes in the contexts of rapid technological change. It is hoped that the reader will also gain from the findings.

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INTRODUCTION

Methodology and presentation

The study is divided into three parts:

Part I deals with the scope of Information Technology (IT) in India, its impact on employment especially of women in the services sector, and training available for IT. This is based on published literature including government reports and studies done by women's organisations.

Part II is an empirical study of ten organisations with headquarters or major operations in Bombay. These were seen as being fairly representative as Bombay is the industrial, commercial and financial hub of the country.

Six organisations were selected which were using IT on an appreciable scale and which also employed a fair number of women at all levels. Four institutes were selected, which offered training in IT.

Using questionnaires, information was collected from senior personnel, on the profile of the organisation, its recruitment and promotion policies, the use of IT and its training programmes for IT. Interviews were also held with women employees at different levels in these organisations. Training institutions were visited to collect information on the courses conducted and the participation of women in them.

It is interesting to note that data on employment, promotion, training, etc. segregated by sex is not normally maintained by organisations or training institutes - most were able to make them available with some effort but some large organisations could only give approximate figures.

Part III is an analysis of the empirical findings in the context of the enabling environment. It offers some recommendations for practical action.

PART I

THE ENABLING GOVERNMENT

The scope of information technology

The introduction of information technology

In a country of 800 million people, with the high rate of unemployment being a matter of national concern, the introduction of automation was not considered desirable until the 1980s. Throughout the seventies organised labour was strongly anti-automation in most parts of the country and especially so in West Bengal. The Government view also was not in favour of automation or computerisation except in very selected areas like space research, atomic energy, defence and fundamental scientific research.

In the decade of the eighties, large volumes of transactions and increased complexity of operations began to bring about a gradual change in attitudes. It was only in 1984, however, that the Government made a firm and clear statement in favour of using information technology to "take the country into the twenty-first century".

The use of information technology

Information Technology (IT) has been defined as the science of collecting, storing, processing and transmitting information. Widespread use of IT is dependent on the ready availability and efficient functioning of both the equipment e.g. computers, photocopiers, facsimile machines, micro-fiche, etc. and the communication network.

All imports into India are controlled by government policy; IT equipment has not been on the list of freely importable items. Consequently, it was only after the establishment of Indian companies manufacturing IT equipment in India in 1980-81 that this equipment became available in large quantities and with steadily declining (affordable) prices. Today in urban areas photocopiers are ubiquitous and every establishment, big or small, uses photocopying facilities either in-house or at the corner shop. The number of micro-computers installed is about 40,000 and is growing at the rate of 20,000 per annum.

However, 70 per cent of the population lives in rural areas, in towns or villages having a population of less than 20,000. In some villages, stable power supply is still not available. Further, the man-machine interface has, so far, been exclusively in English. With the development of software and video and printed input and/or output in Indian languages, the usage should increase substantially. At the current time, however, IT has a limited presence in the rural areas.

The information technology industry in India

In a planned economy, government policy has a far-reaching impact on what happens in the country. Since the announcement of the new Computer Policy in 1984 and further enhancements in 1986, the computer industry has made rapid strides.

Table 1: Production of electronic equipment and components (in Rs. million)

Sector	Calendar year production				
	1982	1983	1984	1985	1986
Consumer electronics	3 370	3 300	5 870	10 300	12 750
Instrumentation and industrial electronics	1 940	2 510	3 350	4 040	5 250
Computers	480	780	920	1 550	2 800
Communication and broadcasting	2 550	2 700	3 205	3 800	5 040
Aerospace and defence	1 085	1 260	1 490	1 960	2 220
Components	2 140	2 300	3 030	4 100	5 100
Export processing zone	485	750	1 035	850	440
Total	12 050	13 600	18 900	26 600	34 600

Source: Department of Electronics Annual Report, 1986-87.

Table 2: Growth rates of production of electronic equipment and components

Sector	Percentage increase over previous year			
	1983	1984	1985	1986
Consumer electronics	- 2.2	77.8	75.5	23.8
Instrumentation and industrial electronics	29.4	33.5	20.6	30.0
Computers	62.5	17.5	68.5	80.6
Communication and broadcasting	5.9	18.7	18.0	32.6
Aerospace and defence	16.1	18.3	31.5	13.3
Electronic components	7.5	31.7	35.3	24.4
Export processing zone	54.6	38.0	- 2.4	42.6

Source: Department of Electronics Annual Report, 1986-87.

From table 1 and table 2 it is evident that computer systems, though a small part of the electronics industry, is the fastest growing segment with growth rates of 68.5 and 80.6 per cent in 1985 and 1986. There are ten large and about 30 small companies manufacturing or assembling IBM-PC compatible micro-computers. For the manufacture of mini-computers and mainframes most of the multi-nationals have a technical or financial collaboration with Indian companies, with their equity holding restricted to a maximum of 40 per cent by the Foreign Exchange Regulation Act (FERA). DEC, CDC, Unisys, Hewlett Packard, ICL, Phillips, Norsk-Data, Data General and Wang all have a presence in the Indian marketplace through Indian companies.

Large mainframes like those for monitoring wagon movement in the railways or for setting up data communication networks (INDONET and NICNET) and reservation systems for Air-India and Indian Airlines are imported from IBM, NEC, Unisys and others, as a result of global tenders floated by the Department of Electronics.

Photocopiers are also manufactured by Indian companies in collaboration with international market leaders like Xerox, Canon, Sharp, Ricoh and others. Facsimile machines have just begun to be made in India and are currently present in limited numbers.

There are chains of "shops" offering office automation products in all the metropolitan cities (Bombay, Calcutta, Delhi, Madras, Bangalore, Pune, Ahmedabad, Hyderabad). There are about ten large software houses and 200 to 300 consultancy groups offering packages for personal computers as well as tailor-made solutions for micro, mini and mainframe computers.

The communication network

This very important element of information technology has until recently been a bottle-neck. The telephone network, which is mainly analogue, offers Subscriber Trunk Dialing facilities (STD) between most of the major urban centres; it also offers International Subscriber Dialing (ISD) to the United States and Europe and many cities in the Middle and Far East. In terms of data transmission, leased lines were offered, on a limited basis, from 1980 onwards and in 1986 dial-up facilities were offered on the Public Switched Telephone Network (PSTN).

It has been officially recognised that the quality of service for both voice and data transmission needs to be improved considerably. Accordingly digital networks are being installed wherever new exchanges are set up, or where old equipment (analogue) is being replaced. There is a definite plan to develop an Integrated Digital Network (IDN) during the 90s and to move towards an Integrated Services Digital Network (ISDN) possibly by the year 2000.

The manufacture and sale of PABX equipment, telephones and modems which was the monopoly of the Post and Telegraph Department were opened to the private sector in 1986; these products are now freely

available and are being installed in appreciable numbers in large offices in urban areas. However, for communication between offices in the same city or between cities they must still depend on the public sector telephone network.

In order to set up a large government information network to link the central with the State Governments and the latter with 438 District Administrations across the country, the National Informatics Centre (NIC) is setting up micro-earth stations connected by satellite to the mother station in Delhi.

Since 1984, several steps have been taken to reorganise and revitalise the operations of the Government Post and Telegraph Department. To start with semi-autonomous bodies (called Mahanagar Telephone Nigams) have been set up for Bombay, Calcutta, Delhi and Madras. These bodies have been permitted to raise funds from the public by way of bonds thereby removing the bottle-neck of finance, which held back the modernisation of equipment for many years. The Videsh Sanchar Nigam (also semi-autonomous) is responsible for overseas communication. There is a centre for Development of Telecommunications (C-DOT) established specifically to develop appropriate technology especially for the rural areas.

The export of software has been recognised as an area with great potential for India. Accordingly, along with other measures, technology parks are being set up in Bangalore (already operational) Pune and Bubaneshwar around large NEC mainframe computers with satellite links to the United States and Europe. The convergence of computers and telecommunication technology is now recognised and focused on by government agencies like the Department of Electronics (DOE) which, in the context of a planned economy, provide the enabling environment for the spread of information technology.

Summary

Information technology in India therefore is mainly concentrated in the urban areas. In the absence of efficient nation-wide data networks, IT is currently used mainly in the form of stand-alone equipment like photocopiers, electronic PABXs and personal computers and some wide area networks in operation for seat reservation in the airlines and railways. Some other network like a country-wide link-up of branches of some foreign banks and a district administration network for the Government are in the process of being set up.

The employment of women in the services sector

The services sector in which IT is used tends to be concentrated in the urban areas, particularly those offices which have access to table power supply and are large enough to consider the effectiveness of using information technology.

The employment of women in the services sector will be put into context, by looking at the total employment picture in the economy.

Table 3: Total population and employment (in millions)

Year	Population			Workers		
	Total	Females	Females as percentage of total	Total	Females	Females as percentage of total
1971	547.9	264.0	48.2	180.4	31.3	17.4
1981	665.3	321.4	48.3	222.5	45.0	20.2

Source: Census of India.

Table 4: Occupational pattern of female workers (percentage)

Occupation	1971		1981	
	Male	Female	Male	Female
Agricultural workers (cultivators, agricultural labourers, livestock, forestry, fishing)	69.68	82.61	65.60	81.23
Mining and quarrying	0.54	0.40	0.62	0.36
Manufacturing, processing services and repairs				
(a) Household industry	3.42	4.24	3.18	4.59
(b) Other household industry	6.70	2.77	8.92	3.55
Construction	1.36	0.65	1.81	0.80
Trade and commerce	6.37	1.78	7.33	2.04
Transport storage and communication	2.86	0.47	3.32	0.38
Other services	9.07	7.08	9.22	7.05
Total	100.00	100.00	100.00	100.00

Source: Census of India.

From table 3 it is evident that while women remained at about 48 per cent of the total population, their presence in the workforce increased from 17.4 to 20.2 per cent between the two census surveys of 1971 and 1981. However, we see in table 4 that the majority of women employed (as much as 82 per cent) are in the agricultural sector, while services (broadly defined as non-agricultural and non-manufacturing) account for approximately 10 per cent of the women employed.

A better picture of how employment of women in comparison to men, has developed in the services sector, is derived from statistics on the "organised sector" which covers all government establishments and private sector establishments employing more than 25 persons.

Table 5: Total Employment in the organised sector ('000)

Industry/service	As of 31 March 1982			As of 30 September 1985		
	Total	Female	Female as percentage of total	Total	Female	Female as percentage of total
Agricultural workers (cultivators, agri. labourers, livestock, forestry, fishing)	1 308	439	3.5	1 446	506	35.0
Mining and quarrying	961	87	9.1	1 072	85	7.9
Total primary sector	2 269	526	23.2	2 518	591	23.5
Manufacturing	6 253	620	9.9	6 154	580	9.4
Utilities	734	18	2.5	804	21	2.6
Total secondary sector	6 987	638	9.1	6 958	601	8.6
Construction	1 183	64	5.4	1 223	60	4.9
Wholesale/retail trade	390	21	5.4	404	24	5.9
Transport and communication	2 841	88	3.1	2 986	112	3.7
Finance, insurance real estate, business services	1 019	92	9.1	1 226	126	10.3
Community, social and personal services	8 806	1 466	16.6	9 569	1 758	18.4
Total services sector	13 056	1 667	12.8	14 185	2 020	14.2
Total employed	23 495	2 895	12.3	24 884	3 272	13.2

Source: Government of India Employment Review.

Table 6: Employment of women in the organised sector ('000)

Industry/service	As of 31 March 1982		As of 30 September 1985	
	Total	Female as percentage of total	Total	Female as percentage of total
Agricultural	439	15.1	506	15.5
Mining and quarrying	87	3.0	85	2.6
Total primary sector	526	18.2	591	18.1
Manufacturing	620	21.4	580	17.7
Utilities	18	0.6	21	0.6
Total secondary sector	638	22.0	601	18.4
Construction	64	2.2	60	1.8
Wholesale/retail trade	21	0.7	24	0.7
Transport and communication	88	3.0	112	3.4
Finance, insurance, real estate, business services	92	3.2	126	3.9
Community, social and personal services	1 466	50.6	1 758	53.7
Total tertiary sector	1 667	57.6	2 020	61.7
Total women employed	2 895	100.0	3 272	100.0

Source: Government of India Employment Review.

Looking at table 5 women have increased their participation in the services sector from 12.8 per cent of all employees in the sector in 1982 to 14.2 per cent in 1985. Further, apart from agriculture where women contribute 35 per cent of the workforce, the largest proportion of women is to be found in what is called the community, social and personal services (16.6 per cent and 18.4 per cent in 1982 and 1985 respectively). This classification covers central and State Governments, local bodies, education, health, welfare, radio and TV, research and scientific activity, domestic work and repairs of all kinds.

In table 6 again, of the 2.8 million employed in 1982, 57.6 per cent were in the tertiary sector with as much as 50.6 per cent being in community, social and personal services; in 1985 this goes up to a total employment of 3.2 million of whom 61.7 per cent are in the tertiary sector as a whole and 52.8 per cent are in community, social and personal services.

Summary

While women constitute 48 per cent of the population they constitute only about 20 per cent of the total workforce. In the organised sector where IT is most likely to be used, women constitute 14 per cent of all employees in the services sector, and the largest concentration of the 3.2 million women in the organised sector is in services (61.7 per cent).

The impact of information technology on employment in the services sector

Most of the organisations, both in the private and the public sector, which employ large numbers of people in service functions, have strong workers' organisations. When government opinion began shifting towards automation, many of the white-collar workers' organisations in insurance, banking, etc., agreed to take the issue to the negotiating table. While computers were allowed to be introduced, a categorical assurance was taken from the management that there would be no redundancies as a result of computerisation. Further, in many cases, a special allowance was to be paid to the employees who would be using computers and, in a few cases, to all employees in the organisation.

As a result, while the use of information technology has been expanding at a significant rate, there has not been a major loss of jobs. However, in the light of sharply rising costs per employee, many large employers in the services sector, both public (banking, life and general insurance, railways, posts and telegraphs, etc.) and private, keep a close control on new recruitment and place emphasis on increased productivity. In this environment the growth of employment of both men and women in the services sector is likely to be at a slower pace than the growth in business.

The introduction of IT has created thousands of new jobs in manufacturing, marketing and supporting computer hardware and software, in systems analysis, programming and operating, in publishing and marketing computer literature and in training. The Department of Electronics has estimated that during the Seventh Plan Period (1985-90) the estimated number of computer professionals required will be 80,000.

Training for information technology

In India, training for IT (principally the use of computers) comprises:

(a) courses offered by academic institutions leading to university degrees or diplomas;

(b) courses offered by private training institutes;

(c) in-company courses;

(d) computer literacy courses in schools.

Courses offered by academic institutions

The Department of Electronics has initiated a number of programmes jointly with the University Grants Commission, the Ministry of Human Resources Development, the Director-General of Education and Training and the State Governments.

The main programmes are as follows:

- One-year Post-Graduate Diploma in Computer Applications, offered at 24 universities (nine more identified).

- One-and-a-half-year Post-Polytechnic Diploma in Computer Applications, offered at 35 polytechnics (12 more identified).

- One-and-a-half-year Post-Graduate Diploma in Computer Applications in the medium of Hindi, offered at eight centres.

- Bachelor's degree in Computer Science (B.Tech.), offered at 30 centres (three more identified).

- Master's degree in Computer Science (M.Tech.), offered at 22 centres (one more identified).

- Three-year Master's degree in Computer Applications, offered at 24 centres (12 more identified).

Computer courses at the craftsman level

A programme has been jointly launched by the Department of Electronics and the Director-General of Education and Training to meet the requirements of computer-operators-cum-assistant-programmers and data entry operators. Twenty institutes have been identified of which 13 centres have started offering these courses.

Training institutions for women

All the programmes are open to both men and women. However, it is interesting to note that there are some institutions exclusively for women (and included in the list given earlier) which have introduced courses on information technology.

Eight women's polytechnics spread across the country offer the post-polytechnic diploma in Computer Applications, with a requirement of one-and-a-half years full-time attendance.

At the craftsman level, there are two vocational training institutes for women which offer IT courses.

Teachers training programme

For all the above programmes, in order to prone a supply of teachers in sufficient numbers and of the required level of professional competence, several programmes have been initiated.

(a) Reorientation programme for a Diploma in Computer Applications. This is a modular programme of four modules each of six-weeks' duration. The minimum prerequisite for admission is a Master's Degree in Science, or a Bachelor's Degree in Electronics or Technology. There are six institutions conducting this course.

(b) Orientation programme for a Master's in Computer Applications. This is a modular programme of four modules each of eight weeks duration. The minimum prerequisite for admission is a Master's Degree in Science or Technology. Two centres are currently offering this training.

(c) Cross-migration programme. This programme is meant for existing teachers in colleges who have a Master's in Technology or a Doctorate and those who have obtained their Doctorate in Physical and Mathematical Science, have used computers extensively in their research and wish to enter the teaching profession.

Courses offered by private institutions

Since the beginning of the decade, and more so since the revised computer policy in 1986, privately run institutes offering computer training have mushroomed all over the country from large cities to small towns. These extend from five large companies with training centres in four or more cities in the country to one or two-person groups who operate out of make-shift classrooms. There is now a total of more than 600 private organisations listed as offering IT training.

Since 1986, there has been a tremendous demand for training from the employed, as well as from recent graduates of schools and colleges. Since the academic intitutions can offer only about 5,000 seats a year between them, the rest seek training at private institutes.

The courses offered range from certificate courses with a duration of one to three months on a part-time basis, to diploma courses with a duration of one year, some on a part-time and some on a full-time basis.

The longer-term courses usually cover the basic fundamentals of programming, systems analysis and design and entry level competence in BASIC or COBOL. The short-term courses are usually oriented towards personal computers and offer courses in database management, spreadsheet software and word processing.

It should be mentioned that it is a matter of some concern to the computing community and to the Government that so far there has been no mechanism for regulating or certifying these private institutes. Consequently the quality of training varies greatly. Students completing the long-term courses of the five or six larger institutes usually find jobs through the placement service offered by the institute or through their own efforts. However, many students find that after spending considerable sums on courses run by small, less well-known institutes, they are unable to find jobs as potential employers do not find them sufficiently knowledgeable.

The Department of Electronics is now seeking to rectify this situation by setting up a certification procedure which would have minimum standards for the course content, practical work and professional level of the faculty.

In-company training courses

Most organisations in both the public and private sector, when they introduce computerisation on an appreciable scale, conduct training courses for the end-users. These range from general computer awareness programmes, to detailed training on the use of personal computer-based software (for database management and spreadsheets). In addition, secretarial staff are trained in word processing and sometimes other PC software as well.

These courses are generally organised by the training departments working together with the EDP department. Almost always the services of an external training agency are retained for this purpose. The courses are usually full-time courses lasting from one or two days to two weeks.

The participants on these courses are usually nominated by the departmental managers in functional areas where PCs, or in a few cases terminals to a mini-computer, are to be operated by end-users. Generally speaking, both men and women have equal opportunity to be selected except perhaps in the banking sector. Since a financial benefit is attached to IT training, union agreements in nationalised banks have stipulated length of service as one of the selection criteria. This could work against women employees, most of whom have entered the banks in appreciable numbers only in the last ten to 15 years.

Computer literacy in schools

In close collaboration with the Ministry of Human Resource Development, the Department of Electronics launched the CLASS project (Computer Literacy and Studies in Schools) in 1984-85. In the past two years, 750 schools have been provided with micro-computers (based on the BBC-Acorn) and suitable software. There are also 50 resource centres which provide technical support services to the schools.

It is interesting to note that out of the total 750 schools 80 are schools exclusively for girls. The rest are either co-educational or exclusively for boys.

Summary

Training for IT is at any early stage of development. At the apex level the Department of Electronics is in the process of setting up four Indian Institutes of Information Technology (IIIT) along the lines of the internationally renowned Indian Institute of Technology (IIT). There are courses established at the Master's, Bachelor's and Diploma levels in Computer Science and Computer Applications; there are vocational courses and the CLASS programme in schools.

In terms of numbers, more people are trained every year by 600 or more private institutes who run a variety of short and long-term courses; these are at present unregulated and hence of varying standard.

Employment prospects for women in organisations using information technology

For using IT either as a computer professional or as an end-user, a certain minimum educational level is necessary. For those who aspire to be computer professionals, a certain proficiency is necessary in mathematics and electronics (for software and hardware work respectively). In order to assess the preparedness of women for IT, it is useful to review the education of women in the last three decades.

Table 7: Trends in female literacy

Year	Males	Females
1951	25.0	7.9
1961	34.4	13.0
1971	39.5	18.7
1981	46.9	24.8

Source: Centre for Monitoring the Indian Economy.

Table 8: Higher education for women

Year	Enrolment of women (in thousands)	Number of women per hundred men
1950-51	40	14
1955-56	84	17
1960-61	150	23
1965-66	271	24
1971-72	469	29
1975-76	595	33
1980-81	749	37
1981-82	817	38
1982-83	880	39
1983-84	940	40
1984-85	1 021	41

Source: Centre for Monitoring the Indian Economy.

It is evident from tables 7 and 8 that since 1951 women have made tremendous progress in the educational field. Female literacy has trebled from 7.9 per cent to 24.8 per cent in 1981 but is still far below male literacy which is at 46.9 per cent.

In the field of higher education (defined as post-high school, university degree, or diploma courses), women have increased in absolute numbers from 40,000 to over one million and have also improved their position relative to men. While there were only 14 women for every 100 men in 1951, there were 41 for every 100 in 1981.

Having established that women are indeed taking up opportunities available for higher education, more particularly since 1971, it is interesting to see the faculties in which women enrolled.

Table 9: Faculty enrolment of women in higher education

Faculty	Women as a percentage of total enrolment in faculty	
	1971-72	1984-85
Education (teachers' training)	28	48
Liberal Arts	33	40
Science	20	30
Commerce	4	18
Law	5	8
Engineering and technology	1	5
Agriculture	1	4
Veterinary Science	1	5
Others	40	39
	23	29

Source: Centre for Monitoring the Indian Economy.

From table 9 we see that while education is the field in which women have the highest representation, steady progress has been made in the science (20 to 30 per cent) and commerce (4 to 18 per cent) faculties. The presence of women in engineering and technology has gone up from 1 to 5 per cent but still remains very low.

One can conclude therefore, that more and more women have been completing higher education, thereby making them eligible to enrol in training in IT both as end-users and as computer professionals (though to a much lesser extent in the engineering and technology area).

Conclusion

In an environment governed by economic planning, the official endorsement since 1984 of information technology is necessary and beneficial to the country has led to rapid growth in the use of IT. IT equipment is being manufactured in the country in increasing amounts and is being used in offices in the urban areas. In the rural areas, however, the absence of a stable power supply and the limited availability of a man-machine interface in Indian languages, have resulted in the very limited presence of IT. The communications network which lies at the very core of IT has not been reliable but is now being modernised and extended as part of a plan to move towards an Integrated Services Digital Network by the year 2000.

In a population of 800 million, while women constitute 48 per cent of the population, they constitute only 20 per cent of the workforce. In 1985 of a total of 14.2 million people employed in "services" in the organised sector (where most of the IT will be used) women constituted 14.2 per cent.

Due to the presence of very strong unions in the services sector (banking, insurance, railways, etc.), IT has been introduced with little loss of jobs either among men or women. However, because of increased productivity as a result of using IT, in the future, the rate of increase in employment in the services sector is likely to be slower than the rate of growth of business or other economic activities. However, for those who will be using various forms of IT and computers in particular, it is expected that there will be greater job satifaction, higher status and a better working environment.

The estimated demand for people trained in IT at different levels is 80,000 over the Seventh Five-Year Plan period (1985-90). Formal education in IT through courses at Bachelor's, Master's, Diploma and Vocational levels is expected to provide about 30,000 during this period. The rest will be trained by private institutes, which over a period of time will offer standardised courses in IT and be subject to certification. Women have been making steady progress in acquiring higher education and are now well-placed to take advantage of the IT training being offered in the country.

PART II

EMPIRICAL STUDY

Choice of organisations

In selecting the ten organisations to be studied in depth certain criteria were applied.

Organisations using information technology

- They should have a fair amount of IT equipment particularly end-user computing facilities.
- They should have a substantial number of women employees with some in senior management.
- There should be a mix of organisations which are purely in the service area (such as financial services) and others, which have a large number of employees in service functions, but which are also engaged in manufacturing and marketing.
- There should be a fair representation of both large organisations with employees in excess of 5,000 and small ones with 100 to 200 employees.
- There should be both multinational and Indian companies, the latter being from both the private and public sector.
- There should be organisations operating for 50 or more years in the country and others which are younger being five or ten years old.

Institutions providing training in information technology

- Both academic institutions and private (commercial) institutes should be represented.
- There should be one or more institution catering solely or largely to women.

Accordingly, the following organisations were selected for the empirical study and their consent obtained.

Organisations using information technology

- Bank of Baroda
- Richardson Hindustan Limited
- Housing Development Finance Corporation

- Voltas Limited

- Glindia Limited

Institutions imparting training in information technology

- SNDT Women's University

- Datapro

- Xavier Institute of Management

- Informatics Computer Systems

The Bank of Baroda

The organisation

The Bank of Baroda is one of the oldest banks in the country, established in 1908 in the princely State of Gaikwad (in present day Gujarat State). It was set up as a Joint Stock Banking Company by a group of Indian businessmen with substantial support from the Maharaja. In 1949 after independence, with the merger of the State of Gaikwad with the Indian Union, the holding of the State (amounting by then to one-third of the Bank's capital) was transferred to the Government of India. In 1969 as one of the 14 major commercial banks, it was nationalised and brought under public ownership.

It has grown steadily over the past 80 years and is today the fourth largest bank in the country with an income of Rs.700 crores (Rs.7 billion) in 1986, global deposits of Rs.7,300 crores (Rs.73 billion) and advances of Rs.3,182 crores (Rs.31 billion). It has more than 10 million deposit accounts spread over 1,900 branches in India and 56 overseas branches in 14 countries.

Nature of business

The Bank's operations cover commercial banking, merchant banking, credit card business, foreign exchange dealings, export finance and participation in various developmental projects including a World Bank scheme for financing ancillary engineering units.

Since nationalisation in 1969, there has been increasing emphasis on two aspects - taking banking to the rural areas (where more than 70 per cent of the population lives) and social banking.

Over the past 15 years, the expansion of branches has taken place largely in the rural and semi-urban areas, which now have more than 65 per cent of the 1,900 branches of the Bank. Social banking includes a number of schemes to extend financial assistance to the agricultural sector, small-scale industries, educated unemployed youth, rehabilitation programmes, etc., and accounts for 42 per cent of the domestic credit extended.

Recruitment and career progression of women

The Bank has in principle an unbiased approach to the employment of women, who have been joining the Bank in appreciable numbers, since 1969.

The employment structure is as follows:

Category	Total employees	Women	Women as percentage of total
Officers	11 047	562	5.09
Clerks	21 744	3 765	17.32
Subordinate staff (peons drivers, cleaning services)	9 571	397	4.15
Total	42 362	4 726	11.16

Clerical positions are advertised and the selection is made after a written test and interview. For the officers' positions, 20 per cent are directly recruited by advertisement, and 80 per cent are promoted from within the clerical staff, as the result of a competitive examination, with consideration being given to seniority and academic qualifications. In recent times, women have been present in larger numbers, both among the directly recruited officers and those promoted internally in 1987; in fact, out of the 150 directly recruited officers 30 were women.

It should also be pointed out that among the female officers there are three who are in Senior Management at the Assistant General Manager level. The Bank also has 13 branches in India, called Ladies Branches, which are managed and operated exclusively by female staff.

There are no differences in salaries, prerequisites or working conditions for men and women.

The question of transfers though is a delicate one. So far, under the direction of the Chairman, the Bank has taken a very sympathetic view about transferring women. While clerical staff (whether male or female) are not transferable, officers are transferable anywhere in India or abroad. However, barring an experiment in 1985 (subsequently discontinued) women officers are posted in their home bases only. As the number of women officers increases, this policy may come under pressure from both the management and the male officers (who get transferred instead of the female officers).

Introduction and use of information technology

Until 1985, in the banking sector as a whole, opposition to automation from the very large and powerful national union of bank

employees meant that IT could be introduced only in a very limited way at the central office level. The Bank of Baroda, like many other nationalised banks, began in 1982 by using bureau services for computerising Salary and Provident Fund Accounting (in the absence of social security in India, the Provident Fund provides retirement benefits). In 1985 after the Agreement on Automation between the Indian Banks Association and the All-India Bank Employees Association, computerisation was introduced, first at the branch level and then at the zonal level. Under the agreement, the uses of the electronic accounting machines (they are not called computers although they are micro-computers) are limited and strictly defined. The same is true for the (Unix-based) mini-computers at the zonal level. At the Bank of Baroda from 1985 to 1987 100 branches, seven zonal offices, the central office and the head office have started using computers for branch accounting, reporting, merchant banking, etc.

Another area where information technology has been introduced is the cheque-clearing operation where, under a project launched by the Reserve Bank of India (the central bank of the country), the MICR (Magnetic Ink Character Recognition) system is used to automate the inter-bank and inter-branch sorting of cheques. MICR encoders have been installed in the Bank's metropolitan branches in Bombay, Delhi and Madras, and all cheques issued to the clients are MICR cheques.

Selection and training for the use of information technology

It is remarkable that both for the end-user jobs in the branches and zonal offices, and for the 60 jobs created in the EDP department, the Bank has relied, almost exclusively, on internal selection and retraining. For the clerical positions using information technology, circulars are issued inviting applications, and the selection is done on the basis of performance in the aptitude tests as well as seniority (in terms of years of service with the Bank). There is a special allowance ranging between Rs.200 and Rs.350 per month (typically amounting to 10-15 per cent of the basic salary) payable to those working on computers/MICR encoders.

It should be pointed out that, while there is a lot of interest among women to move to these jobs, not very many meet the seniority requirement since most of them joined after 1969.

Regarding the jobs in the EDP Department, both at head office and the zonal offices, these are all at officer level and the selection is based on an aptitude test (open to all) with a preference for those under 40 years of age. Currently three out of 61 EDP personnel are women; this includes one analyst/programmer who, as it happened, was the only person to be recruited from outside the Bank (in 1983, before the Agreement).

Information technology training is conducted locally at the clerical level by the vendors of the hardware. So far 500 clerical staff have been trained with 10 per cent of them being women. For the officers, training is conducted at the Staff Training College in

Ahmedabad and nine regional training centres. To date 335 officers (including Senior Managers) have been trained, 3 per cent of whom were female.

It is important to note that for training courses in general, some women officers find it difficult to leave their homes (for course durations of one to two weeks), and travel to the training centres. Further, while the staff Training College at Ahmedabad provides residential facilities on the campus (with a separate wing for women), all participants attending courses at regional training centres receive an allowance and stay in hotels or with family/ friends. Some women do not find this convenient and may as a result, opt out of attending the course.

In addition to training provided by the Bank, employees are also encouraged to take external part-time courses after working hours. There is a list of universities and training institutes providing certificate and diploma courses (a year or less in duration). The Bank reimburses to the employee, the course fees and pays an incentive of Rs.500.

Impact of information technology on women employees

The Agreement on computerisation ensured that there would be no redundancies, thus neither men nor women have lost their jobs as a result of introducing IT in the Bank. On the contrary, those who move into jobs using IT benefit financially from the special allowance mentioned above.

However, over the past two or three years, the nationalised banks as a whole have been found to be overstaffed and the policy in the Bank is to greatly restrict new employment. The use of IT is one of the measures which is expected to contribute to increased productivity among the employees who can then handle increasing volumes of business.

Observations based on interviews with women employees

Women were interviewed at the clerical level (at a branch using computers), at the Branch Manager level of a Ladies Branch, and at the Assistant General Manager level.

The general impression is that women at all levels in the Bank are very interested in learning about IT and using it, possibly even more so than many of their male colleagues. Some of the women are already using IT and others expect to do so in the near future when computers are installed in their branches.

In one case, a female clerk was very enthusiastic about her work with IT as she felt it introduced something new and interesting into an otherwise dull and repetitive job which she had been doing for the past nine years. In fact, she has been doing a number of

There is a special group called Productivity Services (within the Management Services Department) which has been organising the training, together with Corporate Personnel, and providing ongoing support to end-users, using the services of an external training agency. Twenty courses have been conducted over the past two years for more than 400 employees across the country at the managerial, clerical and secretarial level.

Impact of information technology on women

There have been no redundancies caused by the introduction of IT; on the contrary, 70 new jobs were created in the Management Services Department, several of which were filled by women who were transferred from other departments.

In most cases, the women who moved into management services received faster promotions than they would have had in clerical functions. A case in point is one woman who opted for management services, rose within the department, was promoted into the management grade, and then moved out into the purchase function.

A large number of women have already received training as end-users; of the 400 trained all over India, more than 35 per cent were women. In fact, some women have gone on to attend external courses in their own time and at their own expense and may consider becoming computer professionals, possibly even outside the Glindia.

Observations based on interviews with women employees

Women were interviewed at the level of management (junior and senior), section head and at the secretarial levels.

All the interviewees had been with the company for a long time - ranging from ten to 37 years. During their long service some of them, who had joined in production (as general operatives) or as secretaries, have moved through a series of promotions into junior and middle management positions. However, they felt that this was probably not the general rule and most women in such a large and well-established company would probably have to work harder than their male counterparts to move into positions of responsibility. Further, they would have to organise their domestic responsibilities to cope with the longer hours of work and business travel that would be required in senior positions.

All the women interviewed, were enthusiastic about the benefits of using IT in their work, and in fact, one of them had opted to become a computer professional.

Conclusion

The majority of women in service functions have been trained in IT; they all have positive reactions to it. The general feeling was that in the secretarial and clerical functions, it eliminates

external IT courses at her own expense and would eventually like to make a career as a computer professional. This could be accomplished within the Bank if she was promoted to the officer grade (she has tried but has been unsuccessful so far) and then selected for a position in the EDP Department. As mentioned earlier all computer professional jobs are in the officer grade. With qualifications in banking and in law, she feels underutilised at the moment, and IT could well provide her with better career prospects outside the Bank, if it does not happen within it.

Women at the middle, and more so at the senior management levels, felt their career progression was definitely fastest in "operations". They appreciated the Bank's sympathetic view of the transfers (or rather non-transfers) of women officers. This enabled them to stay in their home base and still hold managerial jobs. However, after a certain level, it is essential to be able to move out on transfer. They felt that having a home to run and children to bring up they could not accept a transfer and would have to settle for positions in administration rather than operations, in effect, setting themselves limited career goals and falling short of what their education, experience and ability would otherwise have made possible.

It is interesting to note that at the Ladies Branch the clients are both men and women. The Branch handles a sizeable amount of business (Rs.8 crores in deposits and Rs.50 lakhs in advances); and has seven officers and 14 clerks. It consistently meets all targets and as the manager emphatically stated, it demonstrates quite clearly that an all-woman team can work effectively and harmoniously.

Conclusion

Women employees in the Bank have equal access to training for IT and to jobs using IT. However, since length of service is a criterion for moving into jobs using IT, the percentage of women selected for these jobs is lower than that of men. With the entrance of women increasing over the years, this will hoptefully improve.

The Richardson Hindustan Limited

The organisation

The Richardson Hindustan Limited (RHL) is part of the multinational group Richardson Vicks Inc., which has an equity holding of 40 per cent in the RHL. It started its marketing operations in India in 1957 as a branch of Richardson Vicks Inc. and in 1966 it was incorporated in India and commenced its manufacturing activities. In 1985, Richardson Vicks Inc. was acquired by Procter and Gamble making the RHL an affiliate of Procter and Gamble.

The RHL has grown over the years to reach a sales turnover of Rs.45.7 crores (Rs.457 million) in 1987. It has its general office in Bombay, regional offices in Bombay, Delhi, Calcutta and Madras and its manufacturing plant at Hyderabad.

Nature of business

The RHL manufactures and markets over-the-counter health care and personal care products. The company has been doing significant research and development work in ayurvedic drugs (ayurveda is an Indian system of medicine based on herbal drugs). Natural ayurvedic drugs (free of side effects) for chronic ailments like arthritis are currently undergoing clinical trials; they are expected to find a ready market both in India and abroad.

The recruitment and career progression of women

The employment picture is as follows:

Category	Total employees	Women employees	Women as percentage of total
Vice-Presidents	4	0	0.0
Division Managers	11	0	0.0
Department Managers	15	1	6.6
Assistant Managers	32	5	15.6
Executives	22	2	9.0
Total management staff	84	8	9.5
Management trainees	10	3	30.0
Supervisors	108	13	12.0
Confidential secretaries	20	16	80.0
Typists, clerks, assistants	67	26	38.8
Factory workers	318	49	15.4
Field force	123	0	0.0
Total	730	115	15.7

The company has a fairly good representation of women: almost 10 per cent in management, with a 30 per cent representation among the entry-level management trainees. In addition to large numbers in traditional jobs like secretarial and clerical work, women have made their presence felt in research and development where 11 out of 15 supervisors and 4 out of 14 managerial personnel are women.

The company has a clearly stated commitment to three core values - existing for the consumer, respect for the individual and continuing innovation. The emphasis is on recruiting the best at entry level and grooming them carefully to grow with the company. Every year much effort is put into recruiting 10 to 15 graduates of the best management and technical institutes in the country. The latest Annual Report carried a quote from the Vice-President-Personnel which describes the policy of the company: "We will employ throughout the company, the best people we find without regard to race or gender or any other differences unrelated to performance. We will promote on the same basis."

In this environment, women seem to have equal opportunity for career development. Some in fact have had rapid promotions from the supervisor level into management, based on performance. It is interesting to note that many of the women, particularly in management, have joined the past two to three years. This is due in part to a feeling that in the marketing of personal and family health care products, the buyers are largely women and hence women executives can probably make an added contribution in this area. Another reason is that, at the entry level (where most of the recruitment is done), women applicants have been present in significant numbers only in the last five years.

The introduction and use of information technology

Electronic data processing was first introduced into the RHL in 1979 with the computerisation of financial accounting. This was followed by applications like inventory control in manufacturing. The processing is done on an in-house mini-computer.

With the introduction of personal computers in 1986, end-users have started putting them to interesting uses. In R and D, for instance, they have a database of 900 ayurvedic plants and 8,000 herbal recipes which they use in the development of ayurvedic drugs. The sales and marketing department do extensive brand analysis, tracking and projection on their PC. One PC is used as a link to the Procter and Gamble headquarters in Cincinnati and through that, to the P & G offices world-wide.

Training for information technology

The EDP Department is staffed mainly by taking employees from other departments and training them. Technical training updates are provided periodically by sponsoring staff to attend external seminars and courses, including training at overseas locations.

The end-user training has been handled by an external agency. Over the past two years about 15 courses have been conducted to train 91 people at the general office and 30 supervisors at the factory. Exclusive use is made of self-teaching tutor software on various PC applications. The emphasis is on creating an awareness of what PCs can do in the area of word processing, spreadsheets and database management. The branches are expected to receive PCs and the required training in the next phase.

It is a stated objective of the company that in the near future, office-workers at all levels will have attended an orientation course, and will use computers in their work.

The impact of information technology on women

There has been no redundancy of men or women. Women have reacted very positively to the introduction of office automation. From secretaries to managers, women have attended orientation courses or in some cases taught themselves by working with the tutor software and seeking assistance when necessary.

In certain areas especially in research and development they felt that much of the information retrieval and matrix manipulation would be impossible without the personal computer. Most of the women intend to learn more about the advanced features of the PC software they use; they feel this would be achieved more by practical experimentation than by formal training and with PCs increasing in number in the office, they are confident of being able to do it.

Observations based on interviews with women employees

Women were interviewed at the level of confidential secretary, Assistant Manager and Department Manager.

All those interviewed felt that the management at RHL was sympathetic to the needs of individual employees be they men or women. In two cases complications before and after childbirth had necessitated absence from work of nine to ten months and this was willingly granted. Further, the prolonged medical leave did not have a negative impact on promotion or career progression.

The interviewees felt that at RHL they were treated as "persons" rather than "women" and hence had equal opportunity for advancement! For instance, the RHL has a policy of sending all management staff and supervisors into the "field" for a few days each year, to experience first hand the market reactions to the company's products. Both men and women from every function, be it finance, personnel or research, have had this exposure, which has given them a new perspective in their own jobs and has helped build the sense of belonging to a team.

Conclusion

The benefits of information technology are well recognised at the RHL and the office automation culture is being firmly established. This orientation, combined with a very "open" attitude to employees, both men and women, ensures that women at the RHL have access to the new technology and benefit from it in their careers.

The Housing Development Finance Corporation Limited

The organisation

The Housing Development Corporation (HDFC) was incorporated in 1978 with 10,000 shareholders and the backing of the International Finance Corporation, Washington, the Industrial Credit and Investment Corporation of India and HH the Agha Khan.

In the first decade of its existence it has grown rapidly, with 16 branches all over the country, a gross income of Rs.76 crores (760 million) in 1987, loan approvals of Rs.237 crores (Rs.2.3 billion) and disbursement of 175 crores (Rs.1.7 billion).

Nature of business

HDFC provides finance for housing to individuals, co-operative societies and corporations, 46,000 units having been assisted so far.The accent has been on extending its services to the underprivileged, especially in the rural areas (for instance, financial assistance for the construction of 8,700 dwellings for tea garden workers in Assam and Bengal), rehabilitation of the poor stricken by natural calamities, and the rehabilitation of Bombay's pavement dwellers.

Funds are raised, through a variety of deposit schemes, from individuals and corporations. A significant source of funds has been the borrowing of US$90 million through the United States Agency of International Development (USAID), as a result of which HDFC has financed about 34,000 low-income families.

In recent years, HDFC personnel have been providing consultancy on housing finance to neighbouring countries like Bhutan and Bangladesh.

The recruitment and career progression of women

As compared to many other organisations, HDFC has a relatively high proportion of women. This can be related to the fact that it is a "young" company (10 years old) with the average age employees being no more that 30 years.

The employment picture is as follows:

Grades	Total employees	Women	Women as percentage of total
General managers	7	0	0.0
Managers	14	0	0.0
Assistant managers	20	3	15.0
Officers	56	12	21.4
Junior officers	47	10	21.2
Executive secretaries	7	6	85.7
Senior assistants	52	14	26.9
Assistants	130	41	31.5
Junior assistants	160	55	34.4
Drivers, housekeeping services	95	0	0.0
Total	588	141	31.5

Recruitment is done largely through personal contacts and occasionally through an employment agency. A graduate degree is the minimum requirement from the junior assistant level upwards. Women

have equal opportunity to be recruited and in fact, in the managementtrainee programme over the past three years, of the 16 management trainees selected, five were women.

There is no difference in salaries or prerequisites for men and women, and equal opportunities for promotion are available to both. Three women have risen to assistant manager level. However, some jobs, in the accounts department for instance, would involve working late frequently, and for these there is a definite preference for male employees (as most office workers in places like Bombay travel between 20 and 40 miles to their place of work). On the other hand, women are specifically requested such as for jobs involving interaction with HDFC's clients, giving information to prospective applicants, or interviewing applicants to assess their credit-worthiness.

The introduction and use of information technology

Information technology was introduced into HDFC in 1982 with a mini-computer to do various data processing functions. In 1985-86 this was replaced with a more powerful mini-computer (UNIX based). At the same time, personal computers were introduced in significant numbers both at the head office and the branches. End-users now employ database and spreadsheet packages extensively in their work and secretaries use word processing as a matter of course.

There are plans to implement an integrated on-line system at the head office with terminals at client-interface locations to provide an instant retrieval of a client's dossier including the status of his/her loan account with HDFC.

Training for the use of information technology

HDFC places considerable emphasis on the training, and development of their human resources. As a result, training for IT has been well-planned and extensive. From 1985 onwards courses have been organised in-house for both managers and staff in computer awareness and PC applications, with advanced-level courses in using database and spreadsheet software. These courses were conducted by external training agencies. Selection for training in IT is made depending on the branches and functions being computerised. The selection is based on aptitude and open to both men and women.

An interesting aspect of the training policy is the "Train the Trainers" programme. Making extensive use of video-aided instruction techniques, and in future, computer-based training, training facilities will be developed as a line function at each branch. The training would include initial orientation to the company, skill development, interviewing techniques, marketing, etc. The use of IT would also be part of the training programme. Of the eight trainers identified, three were women.

HDFC also sponsors its staff and managers on a variety of external seminars and short courses ranging from technical subjects like data communications, local area networks and database design to the use of computers in application areas like personnel management. In

addition, full scholarships for diploma and degree courses are available to the employees.

Impact of information technology on women employees

There have been no redundancies. In the future, however, because of increasing productivity (housing loans processed per employee have gone up from Rs.240 million in 1981-82 to Rs.840 million in 1987), the rate of new recruitment will be slower as compared to the growth in business. Further, computer literacy would be a qualification required for new recruits.

The impact of IT on women employees has been relatively positive with end-user jobs being enriched and routine functions reduced in their drudgery. Nine jobs (eight in EDP and one in Personnel) were created by the introduction of IT and women were recruited for two of them.

Observations based on interviews with women employees

Women were interviewed at the level of executive secretary, assistant and officer.

All the women were very interested in using IT in their work. Some of them have been directly working with personal computers for the past two years and were enthusiastic about how it has made their jobs more interesting. In one case the interviewee was emphatic about the time and effort she has saved by using IT

In more than one instance, expertise in using various software as part of their work has helped women get promotions, wider job responsibility and concomittantly, higher financial remmuneration.

All the women had a strong interest in continuing their education through both formal and non-formal courses. This motivation ranged from acquiring a first degree in one case, to working for a Doctorate in another.

The attention to Human Resources Development at HDFC has evidently achieved the desired results, as all the women without exception felt very positive about their potential to grow and rise within the organisation.

In fact, the sympathetic approach of the management is evident in the leave of absence they grant their employees to pursue self-development opportunities. This "human relations" approach has also contributed to the fact that despite being ten years old, there is no labour union even among subordinate staff, something quite unusual in urban India, for an organisation with close to 600 employees.

Conclusion

In an environment of equal opportunity and systematic training, women employees at HDFC have derived positive benefits from the

introduction of IT. In addition to job enrichment, the savings in time and energy made possible by the use of IT enables them to take on greater responsibility and move to senior positions.

The Voltas Limited

The organisation

Established in 1954, the Voltas Limited was promoted by Volkart Brothers, a Swiss trading concern, and Tata Sons, one of the largest industrial houses in India.

Today it is one of the ten largest private sector corporations in India with a sales turnover of Rs.458 cores (Rs.4.5 billion) in 1987. The corporate headquarters in Bombay provides the supporting services for 12 decentralised divisions which operate as autonomous profit centres through a network of more than 25 offices across the country; there are three manufacturing plants.

Nature of business

The activities of the company range from manufacturing and marketing to the execution of large engineering turn-key projects. Its 800 product lines cater to mass consumer and industrial markets covering air conditioning and refrigeration, machine tools and materials handling, industrial and textile machinery, home appliances, pharmaceuticals and consumer products, agro-industrial products and chemicals.

The large marketing and service force handles products manufactured by the Voltas as also the products of a host of leading manufacturers in India, Europe, the United States and Japan.

The recruitment and career progression of women

The employment picture at the Voltas is as follows:

Grades	Total employees	Women	Women as percentage of total
General managers	16	1	6.2
Senior managers	150	3	2.0
Middle managers	300	6	2.0
Junior managers	500	25	5.0
Total management	966	35	3.6
Confidential secretaries	84	70	83.3
Supervisors	750	25	3.3
General staff	6 000	100	1.6
Total	7 800	230	3.0

One of the main reasons for the small number of women in this large organisation is: for manufacturing, marketing and service functions engineers are recruited and until very recently (the 1980s) virtually no women engineering graduates responded to the recruitment advertisments.

It is interesting to note that some women are in dominant numbers in the personnel function for which they are found to have special aptitude. In fact, the staff administration department at corporate headquarters is headed and staffed almost entirely by women.

National advertisements and recruitment agencies are generally used to announce vacancies and the selection is made using carefully designed testing procedures.

Recruitment is done at the junior management level by campus interviews at leading engineering and management institutes. It is worth noting that, while there are relatively few women in the company, those who are with the Voltas have made a mark in their own fields, rising to very senior positions.

The introduction and use of information technology

The Voltas has been using computers for data processing since 1971, when they used computers to monitor the inventory for a wide range of spare parts for machines they sold and serviced. During the 1970s other applications like sales analysis, manufacturing inventory and financial accounting were included. From 1980, newer and more powerful hardware made possible the integration of the various systems and their extension to cover additional locations in East and South India.

It must be noted that the use of computers at the Voltas has, until 1987, been rather restricted by union agreements which specifically listed applications which could not be computerised. The situation has now changed considerably, encouraging the management to begin the process of decentralising information processing.

The decision to take computing power to the end-user came in 1985-86 when the Chairman himself gave the lead by putting his corporate information system on a micro-computer. Since then, end-users have gradually started developing departmental/divisional information systems on personal computers for instance, in Human Resources Development and in supporting marketing strategy in the pharmaceutical and consumer products division. In the next two years it is expected that personal computers will handle information processing in all branches and zones, at both clerical and managerial levels.

Training for the use of information technology

The systems department, which has about 90 people located at the head office and in the branches and factories, is staffed by external recruits as well as internal transfers. Vacancies are

advertised internally and selection is on the basis of an aptitude test. Technical training is given both in-house and by sponsoring staff on external seminars and short courses.

For training end-users, the Manpower Development Department, in consultation with the Systems Department, has retained the services of an external training agency. An extensive training programme has been drawn up over a 12-month period, covering geographic locations across the country, starting with the senior managers and covering all levels.

The courses range from information systems planning and decision support systems, to developing application proficiency using database and spreadsheet software. All secretarial staff will be trained in word processing. It is interesting to note that there will be one person in the Management Development Department who will be an IT trainer involved full time in training end-users.

Further, one or two persons in each user department will also be provided in-depth training in PC Software to equip them to provide first-line support on an ongoing basis.

Impact of information technology on women

There has been no redundancy of men or women. Women at all levels have equal access to training for IT and have responded to it positively.

In the future, it is expected that word processing will increase the productivity of secretarial staff. Over a period of time therefore, the number of typists and secretaries may not increase proportionately to the growth in business, but hopefully they will have greater job satisfaction.

The view was expressed by some senior managers that women seem to have a special aptitude for using computers as they tend to display in their work greater concentration and attention to detail. Further, since this was a new technology, where there was no long-standing preference for men, women had an equal chance to demonstrate their proficiency.

Observations based on interviews with women employees

Women were interviewed at senior, middle and junior management levels and at the secretarial level.

It is noteworthy that of the four managers at the senior level, three started with the company as junior secretaries or clerks and over a period of 20 to 25 years, moved through positions of increasing responsibility to the senior level, and in one case, to the level of general manager.

All the women managers had demonstrated in their careers, a distinct ability to handle effectively, difficult or delicate jobs. In one

case, the interviewee had been a welfare officer at a manufacturing facility where 95 per cent of the employees were men; another interviewee had spent many years in a marketing management job which involved extensive travel.

One senior manager had been entrusted with several unusual assignments which ranged from being part of a senior-level team to set up a large agro-industrial manufacturing facility in collaboration with the French company Rhone Poulenc, to being seconded by the Voltas to direct the Regional Operations of Project Impact (which is a UN global programme for the prevention of disability). Her current assignment is to focus on consumer affairs and strengthen the service orientation of the company.

All the women felt there was an openess in the company, starting with the Chairman, for women to advance as they could demonstrate their ability to handle jobs with terms of reference traditionally viewed in India as more suitable for men, i.e. extensive business travel or working in a factory environment.

Conclusion

The Voltas is a representative of large organisations manufacturing and marketing consumer durables and capital goods. While women are present in small numbers, some who have spent many years with the company now occupy senior positions, while others in junior management work in an environment which offers training opportunities which could lead to promotion.

The Glindia Limited (formerly Glaxo Laboratories India)

The organisation

The Glindia started in India as Glaxo Laboratories in 1924, with the import of infant foods, and has developed over 63 years into a major industrial corporation with wide-ranging activities and a sales turnover of Rs.194 crores (Rs.1.9 billion) in 1987.

The company has its head office at Bombay, five manufacturing units, four branches and 17 depots all over the country. Forty per cent of the equity of the company is held by Glaxo Group Ltd. UK, 21 per cent is held by Indian financial institutions and the balance by over 100,000 shareholders.

Nature of business

The company has a manufacturing and marketing base which covers high technology bulk drugs, pharmaceuticals, veterinary products, special foods, family products and fine chemicals. The Glindia also exports a wide range of bulk drugs and finished pharamaceuticals to several countries including the United Kingdom, France, Australia, the USSR and Japan.

A sustained contribution is being made by the company in the promotion of public health through preventive measures, particularly

amongst underprivileged urban and rural groups. There is a health education programme operating through public interest advertising and audio-visuals for use by voluntary health organisations; a mobile rural health van, and audio-visual teaching aids for medical education.

The recruitment and career progression of women

The large workforce of 5,700 can be categorised very broadly into production, marketing (field representatives) and support service functions.

The employment picture is as follows:

Category	Total employees	Women	Women as percentage of total
Management staff			
Grade I	67	2	2.9
Grade II	120	4	3.3
Grade III	369	23	6.2
Grade IV	245	16	6.5
Total management staff	801	45	5.6
Field representative	762	1	0.1
Personal assistants	50	39	78.0
Sections heads	115	10	8.7
Clerical	636	169	26.6
Skilled workers	846	92	10.9
General operatives	810	650	80.2
Attendants	1 559	26	1.7
Others (draughtsman, work study assistant, programmer, etc.	121	31	25.6
Total of all employees	5 700	1 063	18.6

At the Glindia (as at many other pharmaceutical companies) women form a large proportion of the workers in the packing area (shown as general operatives) and in the secretarial function (shown as personal assistants). More than 25 per cent of the clerical staff and other workers in programming, work-study etc, are women. Field marketing, however, was the exclusive preserve of men until 1987 when the first woman was appointed.

In management, while women constitute only 5 per cent of the total, there are two women in the highest management grade and an increasing number have recently entered junior management.

There are no differences in remuneration for men and women and in the early 1980s the difference in retirement age for men (58 years) and women (55 years) was removed.

It is interesting to note that the Public Relations Department, which is headed and staffed entirely by women handles a number of activities, including the public health programme, the family planning programme and the publishing of House Newsletters for management and staff (in English, Hindi and Marathi), and a Business Review for business associates and opinion leaders. They also focus on women's issues in different ways. For instance, they recently brought out a "women's issues special" of the management bulletin.

The introduction and use of information technology

The Glindia acquired its first computer (an IBM 1401) in 1967 and used it for data processing in the areas of production planning, financial accounting and sales analysis. In 1979 the computer was replaced by a larger system (Varian 600) and the process of decentralising the EDP activities to factories and branches commenced. In 1985-86 the head office machine was replaced and, in addition, four branches and two factories received mini-computers.

A study is in progress to install a network integrating EDP with office automation and electronic mail covering all the locations in India and linking into the United Kingdom and elsewhere via Glaxonet.

From 1983-84 starting with eight-bit micros and going to personal computers (now numbering 40) IT has gradually moved to the end-users. Today, at one end of the spectrum, secretarial staff use word processing quite extensively, while at the other end, spreadsheet and database programmes are used by operational managers at all levels, at the head office, factories and branches.

Training for the use of information technology

With the exception of data-entry operators (30) who were recruited from outside, all the jobs created when EDP was set up (70 new jobs) were filled through internal transfers and retraining. This pattern was maintained when EDP was decentralised to the factories and branches.

When there are vacancies in EDP (as in other departments), the positions are advertised internally. The selection is then made on the basis of an aptitude test.

Regarding end-users, those whose jobs are going to be computerised receive training. It is interesting to note that there are people well into their fifties who have been trained and are using IT quite effectively.

EDP personnel receive regular technical training updates in database management, communications and local area networks, etc. Each person attends at least one programme a year, whether internal or external.

monotonous and repetitive work, while at the managerial level, it makes them more productive and efficient; in both cases it could make a positive contribution to their career development.

The Shreemati Nathiabai Damodar Thackersey Women's University

The organisation

The Shreemati Nathiabai Damodar Thackersey (SNDT) Women's University was set up in 1916 as a pioneering institution in women's education. It received statutory recognition from the government in 1951. It offers a wide range of Degree and Diploma courses in Technology, the Social Sciences, Fine Arts, Education, Nursing, Science, and Library Science.

Some special features of the University are courses offered through correspondence, and the option of instruction in Indian regional languages - Marathi, Gujarati and Hindi. They also conduct research in women's studies, food and nutrition. There are special programmes for continuing and adult education, education of the handicapped, a legal aid cell and an open university programme.

Training courses in information technology

(a) Post-Graduate Diploma in Computer Applications

The SNDT has been selected by the University Grants Commission and the Department of Electronics to conduct a one-year post-graduate diploma in Computer Science and Applications. The course has been offered since 1985.

It is a full-time course and covers the following modules over two six-month semesters.

- Introduction to computer systems.
- Programming in BASIC and FORTRAN.
- Business Data Processing:

  (i) Systems analysis and design;
  (ii) COBOL;
  (iii) Database concepts;
  (iv) Case studies of business systems.

- Advanced programming and PASCAL.

An important part of the course is a three-month project which is done by each student, working in industry with a computer user, manufacturer or software house.

(b) Short-term courses in continuing education

The SNDT offers short-term courses in the following areas:

- Computer Fundamentals;
- COBOL Programming;
- BASIC Programming.

The classes are conducted daily for two hours over a period of two months.

Computer awareness sessions are also conducted for almost all the students on the Bachelor's and Master's degree programmes in other disciplines.

Course participants

For the post-graduate diploma women graduates with a background in mathematics up to the High School level are eligible; those with a degree in Mathematics, Physics or Statistics are preferred.

Fifty students are selected each year on the basis of their academic record, an aptitude test and an interview.

For the short-term courses admission is open to all including men. The participants range from students on undergraduate courses in other disciplines, to housewives; men also apply in significant numbers (there were ten men in one group of 40 participants).

Other services offered

The Department of Computer Science, which runs the IT courses, assists students in job placement, by inviting potential employers to meet and interview their students. The two batches of students who have graduated so far (with the Post-Graduate Diploma in Computer Science and Applications) have all found jobs in industry.

The Datapro

The organisation

The Datapro was set up in 1976 by a computer professional turned entrepreneur. Over the past ten years it has established itself as a training institute offering a wide range of computer courses, and a software house executing projects for clients in India and abroad. The turnover of the company is in the region of Rs.5 crores (Rs.50 million), and it operates through offices in Bombay and Pune.

Training courses in information technology

The Datapro conducts in-company training programmes as well as courses at its centres, where individual participants can choose from a wide range of course modules.

The details of courses offered are given below:

Course	Duration	Hours per day
Foundation courses		
Computer awareness	3 weeks	2
How to use a PC	3 weeks	1
Programming languages		
Basic	8 weeks	2
Cobol	8 weeks	2
Fortran	8 weeks	2
Pascal	8 weeks	2
C	8 weeks	2
Software packages		
Wordprocessing	3 weeks	1
Database	5 weeks	1
Lotus 1-2-3	5 weeks	1
Symphony	6 weeks	1
Framework	6 weeks	1

Career series

Course	Duration	Hours per day
Diploma in Computer Science	12 months	2
Diploma in Computer Management	6 months	2
Post-graduate diploma in computer software and applications	3 months	5
Advanced Diploma course in computer software, systems analysis and applications (recognised by the Govt. Board of Technical Education)	12 months	2

Course participants

For in-company training programmes, modules are selected from the foundation courses, the programming languages and software packages, depending on the requirements of each company. The participants would typically be senior or middle management (for the awareness programme), junior management, secretarial and clerical staff for the software packages and EDP staff for the programming languages.

At the training centres, the participants are of two types - college graduates or undergraduates who plan to make a career as IT professionals opt for the longer-term diploma courses, while those who are already employed and wish to improve their prospects tend to select shorter "foundation" courses and software package courses

One of the courses offered leads to a diploma recognised by the Government Board of Technical Education; for all the other courses, the Datapro itself awards a certificate or diploma. Entrance to the long-term courses is on the basis of an aptitude test.

The training is imparted through a multi-media approach which consists of lectures, case-study discussions, video-aided instruction and extensive practical work on micro and mini-computers.

Participation of women

The participation rates of men and women in the various courses is given below:

Course	Male participants (percentage)	Women participants (percentage)
Diploma in computer science	74	26
Diploma in computer management	72	28
Post-graduate diploma in computer software and applications	62	38
Advanced diploma course in computer software, systems analysis and applications (recognised by the Govt. Board of Technical Education)	70	30
Languages (like Basic, Cobol Fortran, Pascal, C)	75	25
Computer awareness	69	31
Software packages (like DBase III, Lotus 1-2-3)	75	25

There appears to be the greatest demand from women for courses in word processing and computer fundamentals, whereas there is very little demand from women for Fortran courses which tend to be attended largely by engineers or scientists (very few of whom are women).

It is interesting to note that the Datapro has recently introduced an awareness programme for housewives who feel they need to keep up with their husbands and children who are exposed to the new technology at work or school/university.

Other services offered

Datapro also offers its clients a range of consultancy services which include feasibility studies, software development and job processing on a data centre basis. They also have a retail store called Computer Shack which sells personal computers, media and accessories. For the participants of their long-term courses, they offer job-placement assistance.

The Xavier Institute of Management

The organisation

The Xavier Institute of Management (XIM) was founded in 1963 as the St. Xavier's Social Institute Industry. In 1971 it was renamed the Xavier Institute of Management with greater emphasis on the developemnt of managerial and supervisory skills.

The purpose of XIM is to impart professional and humanistic training, mainly through the social sciences, to all personnel in industry, especially managers. With a view to achieving an integration of academic and practical orientation in its various management development programmes, the full-time and associate faculty are drawn from business, industry, government and the academic world. The teaching methods include group discussions and group dynamics, case analysis, business games, role playing, lectures and audio-visual presentations.

The Institute offers diploma courses in Business Management, Personnel Management, Marketing Management, International Marketing and Export Management, Entrepreneurship, Financial Management and courses in Information Technology.

Training courses in information technology

(a) Diploma in Computer Science

The course was started in 1986, aimed at persons intending to make a career in the field of IT. It is a part-time course extending over one year (two semesters); lectures and practical sessions are conducted for one-and-a-half hours every evening, six times a week.

The course covers the following areas:

- Fundamentals of computer hardware and software.
- Programming in BASIC and COBOL.
- Systems analysis and design, file organisation techniques.
- Application packages - DBase III, Lotus 1-2-3, Symphony, Wordstar.
- Case-studies and project work.

Course participants

The course is open to graduates with high school level mathematics and an ability to think logically. As with all the other courses at the Institute, there is a preference for working students who wish to pursue a new career path.

Participation of women

In a class of 60 to 70 students on the Diploma in Computer Science course women comprised about 30 per cent.

It is interesting to note that the participation of women in certain other courses like Personnel Management, which has been offered for several years, is as high as 60 per cent. Further, several women after successfully completing the course have been promoted into managerial positions.

The Institute expects that, over the years, the participation of women on the computer science course will also increase significantly.

Other services offered

Students have access to vocational guidance and career counselling; a placement cell is also being organised.

The Informatics Computer Systems

The organisation

The Informatics Computer Systems (ICS) started its operations in 1983 at New Delhi and has since grown into an all-India organisation with 15 branch locations. Initially the focus was on computer literacy in schools, however now it has conducted courses in 104 schools, using BBC Acorn micro-computers for practicals.

Over the past two or three years it has also been conducting job-oriented part-time courses at all the ICS branches. One of the branches which is of particular interest is the Bombay branch which is located at the Sophia Polytechnic, an institution which caters largely to women students.

The Sophia Shree Basant Kumar Somani Memorial Polytechnic was established in 1970 by the Society of the Sacred Heart (an international congregation of religous sisters dedicated to the education of youth from the nursery level to the post-graduate level). One of the objectives of the Polytechnic is to work in collaboration with the Government to provide vocational training, particularly for women. The Sophia Polytechnic offers courses in art and textile designing, travel and tourism, dress designing, interior designing, silk screen printing, bakery and confectionery, early child education and (in association with Informatics Computer Systems) information technology.

Courses in information technology

For students being exposed to computers for the first time, ICS offers a foundation course; if the student finds the computer field interesting she/he subsequently follows with the professional course. In addition, there are skill courses on COBOL, Pascal, word processing, database and spreadsheet software.

The courses are part-time and of varying duration as given below:

Course	Duration
Foundation	6 weeks
Professional	6 weeks
Skills	4 weeks
Master COBOL/PASCAL	8 weeks
Diploma programme	4 months
Advance diploma programme	6 months
Advanced Diploma in Computer Software Applications and Management	12 months

The Institute has a large number of PCs which they use to offer practical training which constitutes 60 per cent of all courses.

Course Participation

Only the one-year diploma course restricts admission to those who are graduates or final-year students on a graduate degree course in any discipline, and who have passed the entrance test and qualifying interview. Placement is guaranteed to those who successfully complete this course.

Participation of women

Sixty per cent of the students are women. Many of them start with the foundation course and go on to take longer courses. Twenty pecent of the students eventually go on to become computer professionals. An interesting observation made by the course co-ordinator was that the women students were more serious about their participation in the course than their male colleagues.

Other services offered

ICS also offers consultancy services to selected clients and markets the BBC Acorn-based micro-computer manufactured by SCL (a Government of India enterprise). They also have a placement service for their students.

PART III

CONCLUSIONS AND RECOMMENDATIONS

General observations based on interviews with women in selected organisations using information technology

A total of 23 women were interviewed representing those who had been recent entrants into the organisation as well as those who had spent more than 20 years with their present employer. The women interviewed were secretaries, clerks, junior, middle and senior managers.

There were several interesting observations that emerged from these interviews which would have been repetitive if included in each organisation case study. Hence it was decided to group them together in this section.

(a) More than 90 per cent of the women had achieved an educational level much higher than that of their mothers (most of whom had completed high school) and in some cases, even that of their fathers. They felt their own daughters are likely to attain or exceed the educational level of the interviewees.

(b) All the married women had small families - one or two children. Some had remained single and some had started their working careers only after their children were of school-going age or older.

(c) All the women who were working before marriage (with one exception) had continued working after marriage and childbirth. This was made possible by a combination of a sympathetic employer and a good support system at home. Most had parents or parents-in-law living with them, and/or a dependable live-in maid. The one woman who had to give up work due to ill-health returned to the same company after six years.

(d) All the women in management positions and some in secretarial positions considered their work as a career rather than a job. Some expressed the view that they could not even conceive of themselves as non-working women as their work was such an important part of their lives.

Most of the married women felt that having a career and managing a home and family considerably restricts their social life, but it was not something they minded very much.

(e) All the women, without exception, felt that financial independence was one of the important reasons for having a job. However, in the case of many of the married women, they valued job satisfaction, personal development, and being able to use their education and training, more than the financial reward itself, as theirs was regarded as a "second income" in the family.

(f) It appears that women are not excluded from any particular employment function; however many of them felt that they would not be willing to accept a transfer from their home base, or travel extensively and regularly as would be required, for instance, in a marketing function. Consequently many women do not move up the corporate ladder as quickly as they otherwise would.

(g) Women see themselves as having a special contribution to make in functions involving interaction with people, e.g. customer service at counters or in the personnel department. Many of these areas, however, tend to be staff functions and promotions are not as rapid as in the operations areas.

(h) Women feel they are more sincere about their jobs, less "distracted" by organisation politics. They may be absent because of childbirth or illness in the family; however, at work they feel they perform with greater concentration than their male colleagues.

Conclusions

In the Indian economy, information technology has been recognised as a tool which can contribute significantly to the process of development and to increasing the level of productivity. The stated political philosophy is democratic socialism; this, coupled with strong labour unions, has ensured that the introduction of IT has not led to a loss of jobs in the services sector. Therefore, contrary to the experience of some developed countries, IT has not had a negative impact on the employment of women in terms of retrenchement.

However, it is now clear that in the future, the employment of clerical and secretarial staff will not grow at the same rate as the growth in economic activity. On the other hand, there is a large and growing demand for IT workers at all levels from data entry and computer operators to software writers and publishers; from workers in computer manufacturing factories to marketing; and among research and development personnel. The total demand is an estimated figure of 80,000 during the Seventh Five-Year Plan.

In India, therefore, at the current time, information technology offers women a unique opportunity to acquire a scarce skill and to advance at an equal pace with their male colleagues. As mentioned earlier, IT is a young field in India and hence, men are not seen as having any long-standing superiority over women - as might be the case with engineering or architecture. Further, in a situation where the demand for IT workers is far ahead of the supply, employers are looking for competent people regardless of gender.

The enabling environment is favourable for women to have access to IT and to exploit it for their career development. More than 1 million women are acquiring post-high-school education, thereby enhancing their eligibility for jobs in the services sector,

particularly those using IT. While there are efforts being made to delink jobs from degrees, a graduate degree is still the minimum requirement in many organisations even for a clerical or secretarial position.

In terms of the employment of women, they are employed in larger numbers (at both non-management and management levels) in organisations in the purely service sector (e.g. financial services, particularly banks); in smaller organisations (with 100 to 500 employees) and in younger organisations (those which have been in existence for five or ten years). This reflects the fact that more women have been seeking to enter the workforce since 1970 and the management of many firms has developed a more "open" approach to hiring women in the past ten to 15 years.

Regarding the career progression of women, while management was found to be open to the idea of promoting women into senior positions, it is clear many women find it difficult to cope with the terms of reference and working conditions of such jobs. For instance, in most banks, moving up the ladder usually involves accepting a transfer or several transfers of two to three years away from the home base. In India, as in many other parts of the world, the home and children typically regarded as women's first priority, resulting in women having to pass up promotions which involve relocation. At middle or senior management levels, business travel can be substantial, however, many women in such positions have been able to cope with this due to a good support system at home or at work.

Regarding training in IT, women who are employed in organisations using IT, seem to have equal access as men to training in IT. Students who are preparing themselves for a job, also have access to several private institutes and academic institutions, some of which are exclusively for women. However, there is a need for training courses targetted specifically at women who have the basic qualifications, have spent eight to ten years at home with their children, and now that the children are of school age, would like to re-enter the workforce.

There is also a marked absence of vocational counselling services within the employment organisations and in training institutions.

Recommendations

At the current state of development of IT in India, women could certainly be assisted in exploiting a unique opportunity offered in the ways outlined below. An important factor to be borne in mind is the socio-cultural ethos in India in which a woman (whether working or not) is supposed to give the highest priority to home and family.

(1) Working together with women's institutions (like SNDT Women's University in Bombay) training courses specifically geared towards employment at different levels in the IT area could be organised.

(2) The first requirement would be counselling services which would expose women (both those in the workforce and those planning to enter the workforce) to the various career possibilities; services would include aptitude testing to determine suitability for a career in this area.

(3) In order to tap the large reservoir of talent in the form of women with the requisite qualifications who want to enter the workforce after spending years at home bringing up children, special courses are required. These courses would have two objectives:

(a) to bring about a change in attitudes; very often women do not "see" themselves in technical or managerial jobs and hence fail to meet their full potential. Again, having spent many years at home, they need a boost in their self-confidence to enter the job market where they may have to compete, at least initially, with younger people;

(b) to give them the benefit of a professionally structured and prepared courses with an emphasis on the practical aspects of IT. Parts of the Training Programmes for Improved Office Technology, Productivity and User Satisfaction (OPUS) developed by the ILO, could be used effectively on these courses.

(4) In order to ensure that the training programmes achieve their objectives, there must be a placement cell which keeps in close contact with prospective employers, particularly those who would be willing to offer part-time work thereby assisting women to cope with both home and a job.

(5) The courses listed in point 3 above could also be made available to new graduates and working women. However, for women working in the IT industry, additional workshops could be run as a form of affirmative action, to give them an edge in a very competitive industry.

(6) With the price of personal computers going down, women could be assisted in acquiring PCs to work at home. This will become more and more feasible as the communication network develops over the next two to three years.

(7) The new education policy of the Department of Education specifically identifies women as one of the groups which need special attention. There is also a special department of women and child development in the Ministry of Human Resources Development. These and other agencies could be functional in facilitating women's access to IT training and employment opportunities.

(8) In order to ensure women's career development in IT, measures need to be taken with employers to examine both seniority criteria (which puts women who have the workforce for a period of time at a disadvantage) and terms of reference and working conditions which require relocation, etc. In this regard unions could provide an important impetus.

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